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ABSTRACT

It is argued that the debate between qualitative and quantitative research for educational researchers is actually an argument between constructivism and positivism. Positivism has been the basis for most quantitative research in education. Two different things are actually meant when constructivism is discussed (constructivism and postconstructivism), making the reconciliation between constructivism and positivism nearly impossible. Constructivism holds that learning is a process of building up structures of experience. It is grounded in the works of Richard Rorty, Nelson Goodman, and Paul Feyerabend, whose philosophies are reviewed. As articulated in educational research, constructivism is a species of pragmatism. The second approach to constructivism, styled postconstructivism, is a model based on a split with the pragmatism with which constructivism is linked. The postconstructivist model says that we do not construct reality because it is so rich and significant that all we need to do is "read" it. The postconstructivist alternative is to accept that we cannot impose our wills freely on reality, but that we are not slaves to some configuration of reality. Research into educational technology can advance when constructivism gives up the notion that the order it seeks is simply imposed by the subjectivity of the inquirer. (Contains 43 references.) (SLD)

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Title:

Qualitative Research? Quantitative Research? What's the Problem? Resolving the Dilemma via a Postconstructivist Approach

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Qualitative Research? Quantitative Research? What's the Problem?
Resolving the Dilemma via a Postconstructivist Approach

Introduction

The "qualitative vs quantitative" debate has been part of the fabric of educational research for some time. (cf. Smith, 1983; Gage, 1989; Rizo, 1991; Salomon, 1991 for various discussions of the debate) At stake in this debate is the issue of whether two worldviews of research can coexist, or if one has to eventually either incorporate or discredit the other. Most of the various papers on this debate have been framed at the methodological level of discussion. In this paper, I would like to take a slightly different turn. I would like to argue that it is more useful to look at this debate in terms of the two overarching philosophical positions that ground the debate over methods. In short, I would like to show that the "qualitative vs. quantitative" debate, played out in foundational terms for educational researchers, is actually a constructivism vs. positivism argument.

When we look at current formulations of qualitative methods in educational research, more traditional notions of straightforwardly applying ethnographic and other anthropological and sociological techniques have been more or less replaced with a call to approaching qualitative research from a constructivist perspective. (cf. Guba, 1992; Eisner, 1992; Duffy & Jonassen,1991) Furthermore, most issues that surface in an examination of constructivism are actually metonymous to issues that are found in the larger

qualitative context, and, given the emerging prominence of constructivism in educational technology research, an analysis of constructivism per se ought to be concretely fruitful to the field. Positivism has arguably been the philosophical basis for most quantitative research in education, (cf. Schrag, 1992; for a recent defense of positivism in educational research) and so is the perfect philosophical counterpoint for constructivism.

When we compare constructivism and positivism, I hope to show that there are actually two different things that are meant when the term "constructivism is used, and this makes any simple attempt at reconciling the larger schism between constructivism and positivism nearly impossible. Furthermore, I hope to demonstrate that the schism in constructivism is a function of an older schism, and that in order to move beyond the framework provided by positivistic thinking, we must adopt one of the senses of constructivism over the other. And finally, I am going to propose that since the "wrong" version of constructivism is the sense most currently in usage by educational researchers, that, starting now, we adopt the label of "postconstructivism" to distinguish the "good" version of constructivism from its "evil twin."

Constructivism and Educational Technology Research

Let me start off by saying that some of my best friends are constructivists. I also would like to acknowledge that constructivism draws much of its energy from the same recent historical trends that have come to produce what we consider to be mainstream qualitative research in education, including

holistic ethnography, symbolic interactionism, cultural anthropology, and the like. (cf. Jacob, 1987, for a review of these trends) However, I think it is important for us to realize that most constructivist practitioners assume certain stated and unstated assumptions that ground it very clearly to certain trends of thought, and that unreflectively accepting the basic tenets of these trends can lead us into some troubling consequences.

Merrill (1991) summarizes constructivism as being based on the following assumptions; 1) knowledge is constructed by the learner, 2) learning is a personal interpretation of experience, 3) learning is active, 4) learning is collaborative, 5) learning is situated in real world contexts, and 6) assessment of learning is integrated within the learning context itself. (p. 46) Duffy & Jonassen (1991) acknowledge that "constructivism provides an alternative epistemological base" (p. 8) for research in educational technology. They cite recent work in situated cognition as the basis for much of constructivist theory, (cf. Brown, Collins & Duguid, 1989 for a statement of the basic principles of situated cognition in educational research) contrasting such theoretical work against what Lakoff & Johnson (1980) called the "Objectivist" tradition. When we look at the Objectivist tradition, we find that it is really what we have come to call the positivist position in research. Therefore, it is no surprise that constructivism is deliberately anti-positivistic in its outlook.

While constructivism appears to differ from older, behavioristic models of research, it seems to be perfectly attuned to more current directions in psychology. For instance, Perkins (1991) explicitly links constructivism with information processing theory by noting:

> ...information processing models have spawned the computer model of the mind as an information processor. Constructivism has added that this information processor must be seen as not just shuffling data, but wielding it flexibly during learning - making hypotheses, testing tentative interpretations, and so on. (p. 21)

By linking information processing and constructivism, Perkins brings together contemporary cognitive theory and constructivist theory. This is an important step, because it anchors constructivism within the mainstream of scientific thought in the human sciences. Spiro, et al (1991) continue this thread, by further linking constructivism with schema theory. With its insistence on being more free-form and less centralized, constructivist theory also has a natural affinity to theoretical work in connectionism, (Bereiter, 1991) hypermedia, (Tolhurst, 1992) and multimedia. (Dede, 1992) On a practical educational level, Bagley & Hunter (1992) argue that constructivism is the "glue" that can hold together the combination of technological innovation and restructuring needed in our school systems.

All else aside, the debate about constructivism centers on whether we are willing to take a positivist stance toward research in education as was done in the past, or whether we need a new position. In order to make such a decision, the researcher should be aware of what a position entails, and where it came from. Therefore, we need to focus on where constructivist ideas come from, and why they have such purchase on the imagination of researchers in education and other human sciences.

The Roots of Constructivism

What are the basic tenets of constructivism? Cole (1992) claims that "social negotiation of meaning" and "critical argumentation" (p. 27) are the keystones to the constructivist approach. Cunningham (1991) in his neo-Galilean dialogue between a constructivist and a positivist, has "Salviati" define constructivism thusly:

> Constructivism holds that learning is a process of building up structures of experience. Learners do not transfer knowledge from the external world to their memories; rather, they create interpretations of the world based on their past experiences and their interactions in the world. How someone construes the world, their existing metaphors, is at least as powerful a factor influencing what what is learned as any characteristic of that world. Some would even argue that knowledge that is incompatible with or unaccounted for in an individual's interpretation cannot be learned. (p. 13)

These ideas are quite different from the notions that have guided educational research through most of the twentieth century. What are their historical roots? All talk of cognitive theory and methodology aside, it is reasonable to claim that constructivism is basically grounded in the work of three contemporary philosophers of inquiry methodology - Richard Rorty, Nelson Goodman, and Paul Feyerabend.

Richard Rorty, with his neo-pragmatism, (Rorty, 1982; Trimbur & Holt, 1992) is probably the most influential person in the philosophy of science today, as well as being the heir apparent to Kuhn's tremendously important theorizing on the role of paradigms and paradigm shifting in scientific research. Rorty pushes the idea of the paradigm shift to the extreme with his model of narrative philosophy. In narrative philosophy:

> Rorty shifts the terms from a search for method to a strategy of historicization. He urges us to look at philosophical discourse as language-in-action - not a privileged perspective that holds out the hope of finally moving from speculation to science but simply the stories philosophers tell each other.... To historicize philosophy in this way...means we will no longer possess a universal measure by which to judge knowledge claims and the accuracy with which they represent reality.... To recognize that philosophy is no more and no less than its own narratives is to recognize that we will always get the past that we deserve - not a final definitive version of philosophical problems and issues but the version our present situations calls up. We will have what was there all along - ourselves, our common activities, our attempts to cope with reality. And we will be no worse for our judgements. It is just that our judgements will no longer be concerned with what is true and accurate according to some extrahistorical criteria. (Trimbur & Holt, 1992: 75)

Nelson Goodman's Ways of Worldmaking (1978) reads like a manifesto for the constructivist movement:

> Truth, far from being a solemn and severe master, is a docile and obedient servant. The scientist who supposes that he is single-mindedly dedicated to the search for truth deceives himself. He is unconcerned with the trivial truths he could grind out endlessly.... He seeks system, simplicity and scope; and when satisfied on these scores he as much decrees as discovers the laws he sets forth, as much designs as discerns the patterns he delineates.... Truth, moreover, pertains solely to what is said, and literal truth to what is said literally. We have seen, though, that worlds are made not only by what is said literally but also by what is said metaphorically.... (p. 18)

Paul Feyerabend's (1975) self-styled anarchistic emphasis on the practice of science as opposed to theorizing also strikes a fundamental chord in the constructivist model:

> It is clear, then, that the idea of a fixed method, or of a fixed theory of rationality, rests on too naive a view of man and his social surroundings. To those who look at the rich material provided by history, and who are not intent on impoverishing it in order to please their lower instincts, their craving for intellectual security in the form of clarity, precision, 'objectivity', 'truth', it will become clear that there is only one principle

that can be defended in all circumstances and in all stages of human development. It is the principle: anything goes. (P. 28, italics his).

Guba (1992) explicitly links Feyerabend to his project of relativism which Guba says " ...is an essential element in defining the ontological and epistemological presuppositions of the constructivist inquiry paradigm of which I am a proponent." (p. 17) Eisner, (1992) whose critical version of qualitative methodology is akin to Guba's model of constructivism, draws heavily on Rorty and Goodman in his attempt to critique objectivity in a postpositivist frame. Therefore, we can assume that Rorty, Goodman, and Feyerabend are central figures in the emerging constructivist-qualitative paradigm developing and growing within educational research.

What are the common issues that unite these three foundational constructivist thinkers , and how can we examine those issues to help understand the basic tenets of constructivist thinking? Essentially, Rorty, Goodman, and Feyerabend all share a concern for the historical side to human inquiry, and this is no accident. This is because all three of them see themselves as members of the pragmatist tradition, a tradition that Pepper (1942), in his review of metaphysical positions, labeled "contextualism". Contextualism, furthermore, took its root metaphor from the idea of the historical event. Pragmatism has always looked to the context of practice, in historical and cultural terms, as the basis for resolving issues of meaning. (cf. House, 1991; Cherryholmes, 1992; House, 1992 for a discussion of the role of pragmatism vs realism in scientific inquiry in educational research) Therefore, we can conclude that constructivism, as articulated in educational

research settings, is a species of pragmatism. This link to pragmatism will ironically provide us with the means to move from constructivism to postconstructivism, since we will make that move by linking the concerns expressed in constructivism to the ideas of the philosophers who formulated pragmatism in the first place.

Steps toward a Postconstructivist Model

The path to a postconstructivist model of educational research is based on the split within pragmatism that has shaped that philosophical discipline from its outset. Pragmatism is a movement with two founders - an actual founder (C.S. Peirce) and an expedient founder (William James). Many of the problems that arise in pragmatism are based on the fact that the ideas of the actual founder and the expedient founder are different in important ways.

Let us start with the expedient founder of pragmatism - William James. In 1898, in a lecture at the University of California, James stated his version of pragmatism in such a way that the ideas caught the imagination of the American intellectual community for decades to come. Even though James was careful to acknowledge that his good friend, Charles Peirce, was the founder of pragmatism, few people actually looked at Peirce's ideas. Instead, they followed James's dicta. James's version of pragmatism is fairly simple. He held that pragmatism was a means for determining the truth of certain claims. That method works as follows (James, 1948):

"Grant an idea or belief to be true," it says, "what concrete difference will its being true make in any one's actual life? How will the truth be realized? What experiences will be different from those which would obtain if the belief were false? What, in short, is the truth's cash-value in experiential terms?"

The moment pragmatism asks this question, it sees the answer: True ideas are those that we can assimilate, validate, corroborate and verify. False ideas are those we cannot. That is the practical difference it makes for us to have true ideas; that, therefore, is the meaning of truth, for that is all that truth is known- as. (pp.160-161; italics his)

Now, let us compare James's maxim on the pragmatic notion of truth with the Pragmatic Maxim. This Maxim, first published in 1878 and pretty much ignored thereafter, is Peirce's definition of pragmatism (Peirce, 1955):

Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (p. 31)

Granting that the above quote is hard to understand, let us look at a passage where Peirce explicates his maxim:

...the whole meaning of an intellectual predicate is that certain kinds of events would happen, once in so often, in the course of experience,

under certain kinds of existential conditions - provided it can be proved to be true. (p. 273; italics his)

And elsewhere:

> But of the myriads of forms into which a proposition may be translated, what is that one which may be called its very meaning? It is... that form in which the proposition becomes applicable to human conduct, not in these or those special circumstances, nor when one entertains this or that special design, but that form which is most directly applicable to self-control under every situation, and to every purpose. That is why he locates the meaning in future-time; for future conduct is the only conduct that is subject to self-control. (p. 261)

Finally, let us turn to Murphy's (1990) paraphrase of Peirce's pragmatic maxim, which Murphy calls Peirce's Principle of Meaning:

> If one can define accurately all the criteria governing uses to which a predicate can be put, one will have therein a complete definition of the meaning of what it predicates. (p. 46)

Compare this now with Murphy's (1990) paraphrase of James's theory of truth:

> What is true in our way of thinking is the production of beliefs that prove themselves to be good, and good for definite, assignable reasons. (p. 57)

Peirce and James mean two very different things by pragmatism. Peirce saw the Pragmatic Maxim as a way of determining the logical nature and consequences of certain beliefs in terms of the practical consequences of holding those beliefs. James, on the other hand, saw the Pragmatic Maxim as a method of determining the truth of a given proposition. For Peirce, belief claims were contextual and provisional, yet truth claims were more general and logically accessible. For James, truth claims, not just meaning claims, were provisional and contextual. Because Peirce held that there can be truth over and above what we might think to be true, he is ultimately a realist. Since James always grounds truth claims in contextualist activities, he is ultimately a relativist. And the gap between the two is quite vast.

The pragmatism that informs Rorty, Goodman, and Feyerabend, and thus ultimately the constructivists, is derived from James. For instance, Rorty (1982) turns explicitly to James to make the following points about James's view of truth:

> James's point was that there <u>is</u> nothing deeper to be said: truth is not the sort of thing that <u>has</u> an essence.... Those that want truth to have an essence want knowledge, or rationality, or inquiry, or the relation between thought and its object, to have an essence. Further, they want to be able to use their knowledge of such essences to criticize views they

take to be false, and to point the direction of progress toward the discovery of more truths. James thinks these hopes are in vain. (p. 162)

And this version of understanding the nature of truth is at the very heart of the constructivist program. As we saw earlier, the constructivist holds that we construct knowledge. What is knowledge but those things that we hold to be true? Furthermore, the constructivist rejects the idea that there is a single foundation for basing the pursuit of truth on, and so the question of truth becomes instead an exercise in, what we see over and over again, the "social construction of reality."

Are we doomed to this project of making multiple realities, of just telling each other stories, and letting the question of truth be settled by whose story is more interesting, or whose will is stronger? If we adhere to the Jamesean perspective, then this seems to be the case. But there is an alternative for inquiry - to return to Peirce's initial statements and take them in a different direction.

Postconstructive Research - A Vision

We are at last finally free to talk about qualitative research in general, and thereby finally address the question outlined in the title. Constructivist theory has made significant inroads in the educational research community by offering a vision of research and theory that seems substantially different from the prevailing positivistic vision based on more traditional models of scientific inquiry. Constructivism appeals to the desire of many in the field to be freed

from the constraints of a positivistic model of inquiry. (cf. Glesne & Peshkin, 1992; Lancy, 1993) It cannot be over-emphasized, though, that the fundamental point of constructivism is to deliberately refute positivistic positions. By taking this tack, constructivist ideas are necessarily grounded in the same problematic that the positivist tradition was grounded in; namely, a concern for establishing the proper conditions for gathering and using knowledge. This grounding in the pursuit of knowledge characterizes the basic task of modernist thinkers. (Lyotard, 1979) But the modernist problematic is no longer appropriate. The predicament faced by most constructivists is that they sense a need to shift beyond a modernist perspective, but they attempt to do so by addressing the matter in a modernist fashion.

There is no escaping the fact that we are now living in a postmodern world. Lyotard (Lyotard, 1979; Johnson, 1992) has declared that the postmodern condition is based on the notion that there is no longer a "grand narrative" that defines a single vision for culture. We have to abandon the search for a single perspective through which we can formulate a single best way of doing inquiry. Gergen (1992) shows us that postmodernism involves a turning away from the Enlightenment, with its insistence on individual cognition, rational order, and correspondence models of inquiry, toward a new sensibility of collective rationality, action, and examination of phenomena as "texts" instead of repositories of fact or instantiations of theory. Thinkers such as Heidegger (Guignon, 1992) and Baudrillard (1988) have emphasized that language and its rhetorical nature play a crucial role in the ways that we understand our world, thereby clarifying the "textness" of the world.

Both James and Peirce would appreciate the move in inquiry towards the postmodernism described above. But their characterizations of the situation would be quite different. James leads us away from the pole of strict objectivity by positing a relativist and ultimately subjective model of truth and therefore inquiry, while Peirce rejects the subjective vs objective duality altogether. It is this rejection, which is far more radical than any project that James or the constructivists would suggest,that finally allows us to build the bold and radical vision of qualitative research that education needs in order to function properly in a postmodern setting.

As my fundamental move in this paper, I would like to show how Peirce gets out of the subjective-objective trap, and then show the consequences of this move as the basis for a genuinely qualitative model of educational research, one that does not slip either into the trap of an "anything goes" relativistic subjectivism or the "just the facts" pseudo-scientific objectisitic positivism that has strangled the vitality from educational research. (cf. Shank, 1987; Shank, 1988; Shank, 1990; Shank, 1992; Shank & Cunningham, 1992)

The key to creating a pragmatically-informed model of inquiry is to realize that pragmatism, as Peirce conceived of it, was a totally radical departure from the Enlightenment scenario. That scenario was established by the work of Descartes. In point of fact, the subjective - objective split that haunts modernism is a direct consequence of the Cartesian method of inquiry, known as the method of doubt.

Briefly, the method consists of deliberately doubting the truth of anything, until we arrive at something we cannot doubt; namely, the famous

"cogito ergo sum" or "I think, therefore, I am." This method requires both a subjective observer and the objective realm of the observed. This method also creates an unbridgeable split between the observer and the observed, keeping the observer always out of the very reality of that he/she is trying to observe. Peirce realized that this split was a function not so much of Descartes's intended worldview, but of his method instead. So, in order to create a post-Cartesian worldview, one that is free from the subjective - objective split, we need to create a new method.

To make a long story short, the Pragmatic Maxim was a direct consequence of Peirce's efforts to replace the Cartesian method. Peirce realized that Descartes's method of doubt was flawed because the doubt that Descartes engendered was not genuine. Peirce chose to focus on genuine feelings of doubt that we feel, and the means that we try to alleviate them and move back into states of belief. This fixation of belief in the face of genuine doubt was the basis for all inquiry, in Peirce's view. So long as we have no reason to doubt either our senses or our current understanding of things, says Peirce, then we have no reason not to suppose that they are true. As soon as something intrudes into our current state of understanding, though, we realize that we were not right after all, and that truth is different from what we had held it to be. That instance from experience, furthermore, is a clue that the way that we looked at reality was not quite right, and by that fact alone, we now have a new clue as to the ultimate nature of reality. Through this correctable process, held Peirce, we co-evolve, with the help of experience, a significant understanding of reality, one that we have no reason to suppose that is not true, but one that we cannot feel smugly is correct.

Inquiry, then, becomes an act of "reading" experience to gain more and more clues about the nature of reality. We treat the items of experiences as neither objective facts whose truth we can grasp in an unmediated way, nor as subjective opinions whose truth is simply a matter of what we want it to be. Rather, we treat those items as signs of reality. In order to read them, we have to live in the gap between the objective and the subjective, and we soon come to see that the gap as illusory.

Our postconstructive model says that we do not construct reality, because reality itself is so rich and significant that all we need to do is to read it. But we need to enrich our current conceptualization of "reading." Reading is not a process of extracting information from a printed page, nor is it the creation of meaning. Reading and writing, telling and hearing, and narrating and understanding, are all the same process. We listen to and read stories in an attempt to try to understand the nature of reality a bit better, but we tell and write them for the same purpose. To say that we read and write to get access to reality sounds silly, but to say that we write and tell in order to create reality is just as silly. We can finally argue that the act of "reading" will change both us and reality, since we are both co-evolving. We have the tenets of experience to keep us straight, and the Pragmatic Maxim to keep us from slipping into models of inquiry that lead us away from reality.

What would such a model look like in practical terms? It is legitimately postmodern, in that it realizes that there is no one way to look at reality. But it rejects the notion of dependence on the observer and replaces it with a model of the inquirer as a participant. When we construe the inquirer as a participant, we see that he/she is not looking at reality from some outside or

privileged position, but instead is in the middle of reality. In fact, Peirce would claim that all inquiry begins with us being in the middle of some already existing world, and that our first act is to try to make sense of that world. The constructivist would say that we find ourselves in a situation where we have to make meaning in the sense of imposing meaning on a situation which has no meaning until we put it there. Remember James's old dictum of the "buzzing, booming confusion" we experience until we impose order on it? Furthermore, again following James, the order that we impose then becomes true so long as that truth is useful to us to maintain the order we have already imposed. Pretty soon, we find ourselves in the dilemma of being in a situation where any meaning is totally a product of what we have put there. What does the world become, then, besides ourselves? And what is instructional design under the aegis of this thinking but the use of one's intellectual will to impose a worldview on others, which is then claimed to be true because it conforms to the will of the design creator? And what does educational technology become, then, except for a means to enhance this imposition process? What about the constructivist's claim that the creation of knowledge needs to shift from the designer and instructor to the student? What is this other than the shifting of the will to either the individual or the collective student? At its very best, constructivism with its inherent relativism and dependence of the subjective stance of designers and students, becomes a way to shift from an individual to a collective solipsism.

As Peirce pointed out in his famous essay on the fixation of belief, the only way to maintain a belief which we do not want to abandon is to hold onto it with tenacity and to make sure we do not find ourselves in any kind of

circumstantial situation where that belief might get challenged. The path of constructivism leads inevitably to the championing of the will, rather than the intellect, as the supreme arbiter on what counts as knowledge.

The postconstructivist alternative is to accept that we cannot impose our will freely on reality, but that we are not slaves to some configuration of reality. It accepts the fact that we are always in reality, and in relation to all other systems in reality. And that every experience has significance as a part of the whole picture of reality. And that reality is not constructed, or a simple set of principles underlying a complex surface, but is instead intelligible on its own terms. But we accept that the terms of intelligibility of reality are not directly translatable into human terms. We have to treat experiences as signs of the nature of reality, as answers to questions we are not sure how to ask. We have to shift our model of the inquirer away from the prospector model of the positivist, who seeks to find the nuggets of truth under the welter of experience, and the novelist model of the constructivist, who seeks to create truth out of what seems to be available. The postconstructivist is postmodern in realizing that there any many paths of inquiry, but unlike the constructivist the postconstructivist does not hold that we impose the order we seek by following many paths. The model of the postconstructivist follows along semiotic lines, where the inquirer realizes that experiences are signs of order and understanding and meaning and that they have consequences not just in and of themselves but of how they are taken as signs. The model for the postconstructivist is that of a detective, treating experiences as clues and omens and symptoms of an order that represents a rich and complicated reality that we can only understand within a process of participation as part of

reality itself. The postconstructivist turns away from knowledge per se as the starting point of inquiry, and acknowledges that there is just as complex and as important an inquiry based on increasing understanding, that an inquiry of understanding is just as potentially systematic as an inquiry of knowing, and that any real inquiry of knowing depends on an inquiry of understanding.

So where have we ended up, on this process of going beyond constructivism? I want to charge that educational technology is in a unique position of being able to help further an inquiry into understanding. By developing new technologies and new tools, we can help students not just make meaning out of a jumble of data, but to look at their experiences in a participatory way and to combine and test patterns and clues, and to derive consequences from these clue patterns, and to push forward with new and unique insights. I feel that this was the intended mission of constructivism in the first place, but it cannot achieve that mission unless it gives up the notion that the order it seeks is simply imposed by the subjectivity of the inquirer.

Let me conclude this entire piece and hopefully bring my points home in a concrete way by telling you about a computer program that John Ross and I designed to help illustrate a semiotically informed model of inquiry. We called the program ART, which is short for the Abductive Reasoning Tool. The idea behind ART is that there are potentially a myriad number of insights that can be drawn when we juxtapose two statements in an arbitrary fashion. We start with a topic statement, which the person types in. Then, the computer randomly accesses one of over a thousand generic wise sayings, which is physically juxtaposed with the initial topic and called the

"reflection" statement. The whole point of the process is that the inquirer feels a compulsion to link those two statements as a single meaningful whole, and that such a link will give the inquirer a new insight into the topic. We felt that the random linkage allowed the inquirer to explore different avenues for insights than he/she might ordinarily pursue. By realizing that the linkage is hypothetical and under no burden to be "true" we are allowed to pursue an inquiry of understanding that does not generate any new knowledge. We would not be able to take this stance from a constructivist perspective, since we would be compelled to be making some reality claim, or showing how the linkage we create is in some sense "true".

So, I turned to the program to ask: "How can postconstructivist ideas help clarify the qualitative vs. quantitative debate?"

Here is the actual reflection statement: "Our intelligence wraps in obscurity the simple natural truths in order to get credit for them."

I leave the task of drawing insights to you.

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